

What is claimed is:

1. A shaped article for storing a product, said shaped article being formed from a multilayered structure which comprises in sequence:
  - a) an inner fluoropolymer layer having first and second surfaces;
  - 5      b) an adhesive tie layer, having first and second surfaces, on the inner fluoropolymer layer with the first surface of the adhesive tie layer on the first surface of the fluoropolymer layer; which adhesive tie layer comprises a combination of at least one tackifier, at least one ethylene/alpha-olefin copolymer and optionally at least one styrenic block copolymer; and
  - 10      c) an outer thermoplastic polymer layer, having first and second surfaces, on the adhesive tie layer with the first surface of the thermoplastic polymer layer on the second surface of the adhesive tie layer.
- 15      2. The shaped article of claim 1 further comprising at least one polymer layer on the second surface of the thermoplastic polymer layer.
- 20      3. The shaped article of claim 2 wherein said at least one polymer layer is attached to the second surface of the thermoplastic polymer layer via an adhesive tie layer which comprises a combination of at least one tackifier, at least one ethylene/alpha-olefin copolymer and optionally at least one styrenic block copolymer.
- 25      4. The shaped article of claim 2 further comprising a plurality of polymer layers attached to the second surface of the thermoplastic polymer layer via an adhesive tie layer which comprises a combination of at least one tackifier, at least one ethylene/alpha-olefin copolymer and optionally at least one styrenic block copolymer.

5. The shaped article of claim 2 wherein said at least one polymer layer comprises a material selected from the group consisting a fluoropolymer, a polyamide, a polyolefin, an ethylene vinyl acetate copolymer, polyethylene terephthalate, polyvinyl chloride, polyvinylidene chloride, polystyrene, styrenic copolymers, polyisoprene, polyurethanes, polystyrene, a styrenic copolymer, an ethylene acrylic acid copolymer, a cyclic olefin homopolymer or copolymer and combinations thereof.

6. The shaped article of claim 1 wherein said inner fluoropolymer layer comprises a material selected from the group consisting of a chlorotrifluoroethylene homopolymer, an ethylene-chlorotrifluoroethylene copolymer, ethylene-tetrafluoroethylene copolymer, fluorinated ethylene-propylene copolymer, perfluoroalkoxyethylene, polytetrafluoroethylene, polyvinyl fluoride, polyvinylidene fluoride, poly(chlorotrifluoroethylene) or a poly(chlorotrifluoroethylene) containing copolymer, and copolymers and blends thereof.

7. The shaped article of claim 1 wherein said inner fluoropolymer layer comprises poly(chlorotrifluoroethylene).

8. The shaped article of claim 1 wherein said outer thermoplastic polymer layer comprises a material selected from the group consisting of linear or branched polyolefin homopolymers, linear or branched polyolefin copolymers, cyclic olefin homopolymers, copolymers of cyclic olefins and linear or branched polyolefin homopolymers, copolymers of cyclic olefins and linear or branched polyolefin copolymers, ethylene vinyl acetate copolymers, polyesters such as polyethylene terephthalate, polyamides, polyvinyl chloride, polyvinylidene chloride, polystyrene, styrenic copolymers, polyisoprene, polyurethanes, ethylene ethyl

acrylate, ethylene acrylic acid copolymers, fluoropolymers and combinations thereof.

- 5 9. The shaped article of claim 1 wherein said outer thermoplastic layer comprises a homopolymer or copolymer containing a low density polyethylene, linear low density polyethylene, ultra low density polyethylene, metallocene linear low density polyethylene, medium density polyethylene, high density polyethylene, polypropylene or polybutylene, or a blend thereof.
- 10 10. The shaped article of claim 1 wherein said at least one tackifier comprises a material selected from the group consisting of terpene-based polymers, coumarone-based polymers, phenol-based polymers, rosin-based polymers, rosin esters and hydrogenated rosin esters, petroleum and hydrogenated petroleum-based polymers, styrene-based polymers and mixtures thereof.
- 15 11. The shaped article of claim 1 wherein said at least one tackifier is selected from the group consisting of terpene-based polymers, petroleum and hydrogenated petroleum-based polymers.
- 20 12. The shaped article of claim 1 wherein said ethylene/alpha-olefin copolymer comprises a copolymer comprising an ethylene and at least one alpha-olefin having from three to twenty carbon atoms ( $C_3$ - $C_{20}$ ).
- 25 13. The shaped article of claim 1 wherein said adhesive tie layer further comprises at least one styrenic block copolymer.
14. The shaped article of claim 1 which is formed by co-extrusion blow molding.

15. The shaped article of claim 1 which further comprises a moisture sensitive product enclosed within the shaped article, wherein said product is adjacent to said inner fluoropolymer layer.

5        16. The shaped article of claim 1 which is a bottle.

17. A shaped article for storing a product, said shaped article being formed from a multilayered structure which comprises in sequence:

- 10        a) an inner poly(chlorotrifluoroethylene) layer having first and second surfaces;  
      b) an adhesive tie layer, having first and second surfaces, on the inner poly(chlorotrifluoroethylene) layer with the first surface of the adhesive tie layer on the first surface of the poly(chlorotrifluoroethylene) layer; which adhesive tie layer comprises a combination of at least one tackifier, at least one ethylene/alpha-olefin copolymer and optionally at least one styrenic block  
15        copolymer;  
      c) a polyethylene layer, having first and second surfaces, on the adhesive tie layer with the first surface of the polyethylene layer on the second surface of the adhesive tie layer; and  
      d) at least one polymer layer on the second surface of the polyethylene layer.

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18. The shaped article of claim 17 wherein said adhesive tie layer further comprises at least one styrenic block copolymer.

19. The shaped article of claim 17 which is formed by co-extrusion blow  
25        molding.

20. The shaped article of claim 17 which further comprises a moisture sensitive product enclosed within the shaped article, wherein said product is adjacent to said inner fluoropolymer layer.
- 5      21. The shaped article of claim 17 which is a bottle.
22. A process for forming a shaped article for storing a product which comprises:
- I) forming a multilayered structure by a process which comprises:
- 10      a) forming an inner fluoropolymer layer having first and second surfaces;
- b) attaching an adhesive tie layer, having first and second surfaces, to the fluoropolymer layer with the first surface of the adhesive tie layer on the first surface of the fluoropolymer layer; which adhesive tie layer comprises a combination of at least one tackifier, at least one ethylene/alpha-olefin copolymer and optionally at least one styrenic block
- 15      copolymer;
- c) attaching an outer thermoplastic polymer layer, having first and second surfaces, to the adhesive tie layer with the first surface of the thermoplastic polymer layer on the second surface of the adhesive tie layer; and
- 20      II) forming said multilayered structure into an article by injection molding, blow molding, co-injection blow molding, co-injection stretch-blow molding or co-extrusion blow molding techniques.
23. The process of claim 22 wherein said adhesive tie layer further comprises at
- 25      least one styrenic block copolymer.
24. The process of claim 22 wherein said shaped article is formed by co-extrusion blow molding.

25. The process of claim 22 wherein said multilayered structure is formed into a bottle.

5        26. The process of claim 22 wherein said process for forming a multilayered structure further comprises the step of attaching at least one polymer layer on the second surface of the thermoplastic polymer layer.

10       27. A shaped article for storing a product, said shaped article being formed from a multilayered structure which comprises in sequence:

- a) a first outer thermoplastic polymer layer, having first and second surfaces;
- b) a first adhesive tie layer, having first and second surfaces, on the first outer thermoplastic layer with the first surface of the first adhesive tie layer on the first surface of the first outer thermoplastic polymer layer; which first adhesive tie layer comprises a combination of at least one tackifier, at least one ethylene/alpha-olefin copolymer and optionally at least one styrenic block copolymer; and
- c) a central fluoropolymer layer having first and second surfaces, on the first adhesive tie layer with the first surface of the central fluoropolymer layer on the second surface of the first adhesive tie layer;
- d) a second adhesive tie layer, having first and second surfaces, on the central fluoropolymer layer with the first surface of the second adhesive tie layer on the first surface of the central fluoropolymer layer; which second adhesive tie layer comprises a combination of at least one tackifier, at least one ethylene/alpha-olefin copolymer and optionally at least one styrenic block copolymer; and
- e) a second outer thermoplastic polymer layer, having first and second surfaces, on the second adhesive tie layer with the first surface of the second outer

thermoplastic polymer layer on the second surface of the second adhesive tie layer.

28. The shaped article of claim 27 wherein said central fluoropolymer layer comprises a material selected from the group consisting of a  
5 chlorotrifluoroethylene homopolymer, an ethylene-chlorotrifluoroethylene copolymer, ethylene-tetrafluoroethylene copolymer, fluorinated ethylene-propylene copolymer, perfluoroalkoxyethylene, polytetrafluoroethylene, polyvinyl fluoride, polyvinylidene fluoride, poly(chlorotrifluoroethylene) or a  
10 poly(chlorotrifluoroethylene) containing copolymer, and copolymers and blends thereof.

29. The shaped article of claim 27 wherein said central fluoropolymer layer comprises poly(chlorotrifluoroethylene).

30. The shaped article of claim 27 wherein each of said first and second outer thermoplastic polymer layers comprises a material selected from the group consisting of linear or branched polyolefin homopolymers, linear or branched polyolefin copolymers, cyclic olefin homopolymers, copolymers of cyclic olefins  
20 and linear or branched polyolefin homopolymers, copolymers of cyclic olefins and linear or branched polyolefin copolymers, ethylene vinyl acetate copolymers, polyesters such as polyethylene terephthalate, polyamides, polyvinyl chloride, polyvinylidene chloride, polystyrene, styrenic copolymers, polyisoprene, polyurethanes, ethylene ethyl acrylate, ethylene acrylic acid copolymers,  
25 fluoropolymers and combinations thereof.

31. The shaped article of claim 27 wherein each of said first and second outer thermoplastic layers comprises a homopolymer or copolymer containing a low

density polyethylene, linear low density polyethylene, ultra low density polyethylene, metallocene linear low density polyethylene, medium density polyethylene, high density polyethylene, polypropylene or polybutylene or a blend thereof.

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32. The shaped article of claim 27 wherein said adhesive tie layer further comprises at least one styrenic block copolymer.

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33. The shaped article of claim 27 which is formed by co-extrusion blow molding.

34. The shaped article of claim 27 which further comprises a moisture sensitive product enclosed within the shaped article, wherein said product is adjacent to said central fluoropolymer layer.

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35. The shaped article of claim 27 which is a bottle.

36. A shaped article for storing a product, said shaped article being formed from a multilayered structure which comprises in sequence:

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- a) a first outer polyethylene layer, having first and second surfaces;
- b) a first adhesive tie layer, having first and second surfaces, on the first outer polyethylene layer with the first surface of the first adhesive tie layer on the first surface of the first outer polyethylene layer; which first adhesive tie layer comprises a combination of at least one tackifier, at least one ethylene/alpha-olefin copolymer and optionally at least one styrenic block copolymer; and
- c) a central poly(chlorotrifluoroethylene) layer having first and second surfaces, on the first adhesive tie layer with the first surface of the central

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poly(chlorotrifluoroethylene) layer on the second surface of the first adhesive tie layer;

d) a second adhesive tie layer, having first and second surfaces, on the central poly(chlorotrifluoroethylene) layer with the first surface of the second adhesive tie layer on the first surface of the central poly(chlorotrifluoroethylene) layer; which second adhesive tie layer comprises a combination of at least one tackifier, at least one ethylene/alpha-olefin copolymer and optionally at least one styrenic block copolymer; and

e) a second outer polyethylene layer, having first and second surfaces, on the second adhesive tie layer with the first surface of the second outer polyethylene layer on the second surface of the second adhesive tie layer.

37. The shaped article of claim 36 wherein said adhesive tie layer further comprises at least one styrenic block copolymer.

38. The shaped article of claim 36 which is formed by co-extrusion blow molding.

39. The shaped article of claim 36 which further comprises a moisture sensitive product enclosed within the shaped article, wherein said product is adjacent to said central fluoropolymer layer.

40. The shaped article of claim 36 which is a bottle.

41. The shaped article of claim 36 which further comprises a moisture sensitive product enclosed within the shaped article, wherein said product is adjacent to said inner fluoropolymer layer.

42. A process for forming a shaped article for storing a product which comprises:

I) forming a multilayered structure by a process which comprises:

a) forming a first outer thermoplastic polymer layer, having first and second surfaces;

5 b) attaching a first adhesive tie layer, having first and second surfaces, to the first outer thermoplastic layer with the first surface of the first adhesive tie layer on the first surface of the first outer thermoplastic polymer layer; which first adhesive tie layer comprises a combination of at least one tackifier, at least one ethylene/alpha-olefin copolymer and optionally at least one styrenic block copolymer; and

10 c) attaching a central fluoropolymer layer having first and second surfaces, to the first adhesive tie layer with the first surface of the central fluoropolymer layer on the second surface of the first adhesive tie layer;

d) attaching a second adhesive tie layer, having first and second surfaces, to the central fluoropolymer layer with the first surface of the second adhesive tie layer on the first surface of the central fluoropolymer layer; which second adhesive tie layer comprises a combination of at least one tackifier, at least one ethylene/alpha-olefin copolymer and optionally at least one styrenic block copolymer; and

20 e) attaching a second outer thermoplastic polymer layer, having first and second surfaces, to the second adhesive tie layer with the first surface of the second outer thermoplastic polymer layer on the second surface of the second adhesive tie layer; and

25 II) forming said multilayered structure into an article by injection molding, co-injection blow molding, co-injection stretch-blow molding or co-extrusion blow molding techniques.

43. The process of claim 42 wherein said adhesive tie layer further comprises at least one styrenic block copolymer.

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44. The process of claim 42 wherein said multilayered structure is formed into a bottle.

45. The process of claim 42 wherein said shaped article is formed by co-extrusion blow molding.